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RIMATRIX5®
DRIVING IT-PERFORMANCE

Rittal PMC12 UPS-User Manual

7857.433
7857.434

SINGLE PHASE TRUE ONLINE DOUBLE CONVERSION UPS SYSTEM

4,5 - 6kVA

FRIEDHELM **LOH** GROUP

A 38862 03 IT 74e

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1. Important Safety Instructions

1.1. Documentation Notes

The audience for this guide is the technical specialist familiar with the assembly, installation and operation of the PMC12 UPS-System.
You should read this operating guide prior to commissioning and store the guide so it is readily accessible for subsequent use.
Rittal cannot accept any liability for damage and operational malfunctions that result from the non observance of this guide.

1.2. Retention of Documents

This guide and all associated documents are part of the product. They must be given to the operator of the unit and must be stored so they are available when needed.

1.3. Symbols Used

The following safety and other notes are used in this guide:

Symbol for handling instructions:

- This bullet point indicates that you should perform an action.

Safety and other notes:

Danger!
Immediate danger to health and life!

Warning!
Possible danger for the product and the environment!

Note!
Useful information and special features.

1.4. Safety Instructions

1. Assembly and installation of the UPS, in particular for wiring the enclosures with mains power, may be performed only by a trained electrician. Other tasks associated with the UPS, such as the assembly and installation of system components with tested standard connectors, and the operation and configuration of the PMC12 UPS-System may be performed only by instructed personnel.
2. Do not open the case, as there are no serviceable parts inside. Your warranty will be void.
3. Do not try to repair the unit yourself; contact your local supplier or your warranty will be void.
4. If liquids are spilt onto the UPS or foreign objects dropped into the unit, the warranty will be null and void.
5. Do not install the UPS in an environment with sparks, smoke or gas.
6. This UPS is equipped with an EMI filter. To prevent potential leakage current hazard, ensure that the AC main supply is securely grounded.
7. This UPS is designed to be installed and commissioned in a sheltered, controlled environment as follows:
   - Operating temperature 0-40℃ and 30-90% non-condensing humidity.
   - Always avoid contact with direct sunlight.
   - Do not install the UPS in inflammable or hazardous environment.
   - Dusty, corrosive and salty environments can do damage to any UPS.
   - Install the UPS indoors as it is not designed for installation outdoors.
8. To prevent any overheating of the UPS, keep all ventilation openings free from obstruction, and do not place anything on top of the UPS. Keep the UPS rear panel 20 cm away from the wall or other obstructions.
9. The battery will discharge naturally if the system is unused for any length of time.
10. Install the UPS away from objects that give off excessive heat and areas that are excessively wet.
11. Always switch off the UPS and disconnect the batteries when relocating the UPS.
12. It should be recharged every 2-3 months if unused. If this is not done, then the warranty will be null and void. When installed and being used, the batteries will be automatically recharged and kept in top condition.
13. Make sure that the AC main supply outlet is correctly grounded.
14. Please ensure that the input voltage of the UPS matches the utility supply voltage. Use a certified input power cable

with the correct plugs and sockets for the appropriate voltage system.

15. Observe the valid regulations for the electrical installation for the country in which the unit is installed and operated, and the national regulations for accident prevention. Also observe any company-internal regulations (work, operating and safety regulations).
16. Use only genuine or recommended parts and accessories. The use of other parts can void the liability for any resulting consequences.

1.5. Proper Use

This UPS is designed for providing power to IT systems. A use different from that described here is considered to be an improper use. Rittal cannot accept any liability for damage resulting from the improper use or the non-observance of this guide. The guides for the used accessories may apply.
Rittal prohibits the use for life-preserving applications (such as the use in hospitals or the direct patient care). Rittal expressly does not sell its products for such applications. Rittal will not accept any responsibility if a UPS is used in this area.

1.6. Storage Instructions

For extended storage in moderate climate, the batteries should be charged for 12 hours at 3 month intervals by connecting the UPS to the utility supply and switch on input breaker located at UPS rear panel. Repeat this procedure every 2 months if the storage ambient temperature is above 30°C.

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2. Product Introduction

2.1. General Characteristics

The double-conversion technology in accordance with the specification VFI-SS 111 guarantees the power supply to connected terminal devices with a pure sinusoidal voltage.

1. The ultra-efficient PWM technology achieves a high efficiency for an almost sinusoidal output voltage. The high crest factor of the converter filters any switch-on current peaks without the loading needing to be modified.
2. A fully digitalised control circuit provides a high level of protection and enables future upgrade. In-built communication capability enhances its ability for remote control and monitoring.
3. The multi-functional LCD/LED panel will display various status of the UPS. The LED display may show UPS working status, Utility Status and UPS Abnormal status, whilst the LCD display may show Input/Output Voltage, Frequency, Load Status, Inner cabinet temperature, and Abnormal Phenomenon.
4. To protect the unit from overloading, it automatically switches to bypass mode in 160 seconds~ 40ms (which value is correct?) if loading is at 105%~ 150% of rating and in case of overloading at 150% of rating, it switches to bypass mode immediately. It will automatically switch back to inverter mode once overload condition ceases.
5. If a short-circuit occurs at the output, the UPS switches the system into standby operation. The UPS issues an audiovisual alarm and automatically interrupts the current output until the short-circuit has been corrected manually.
6. Should the unit become overheated, the internal thermal switch will detect the heat and switch to bypass mode and vice versa.
7. Maintenance-free sealed-type battery minimises after-sales service.
8. The maintenance bypass switch provides easy and safe troubleshooting or maintenance function when the utility is normal.

2.2. Special Features

The transformer-free converter technology with a housing that can be mounted in a rack or used as floor-standing enclosure allows the UPS to be integrated even in environments with restricted space.

1. The UPS is equipped with an intelligent microprocessor-based controller and offers a flexible configuration capability with remote communication and comprehensive overload protection.
2. A large 184 V ~ 288 V input voltage range permits an undervoltage and overvoltage correction without unnecessary battery discharge and so ensures an increased battery lifetime.
3. The cold start function ensures that the UPS can be switched on even when no mains voltage is present (see chapter 5.2).
4. An optimum battery management system analyses the charging state of the battery in order to maximise the battery lifetime.
5. The "Active Power Factor Correction (PFC)" control function keeps the "Input Power Factor (PF)" of the UPS to a value > 0.99. This allows an excellent energy efficiency to be attained.
6. Selectable bypass input voltage tolerance (high/low sensitivity) ensures that the consumers are not supplied with undervoltage or overvoltage during bypass operation. The selectable voltage ranges are:
   (i) low sensitivity: 184 ~ 260 V
   (ii) high sensitivity: 194 ~260 V.
7. Fixed selectable output voltages (220/230/240) to satisfy the requirements for different voltage systems.
8. The UPS satisfies all relevant EMC regulations.

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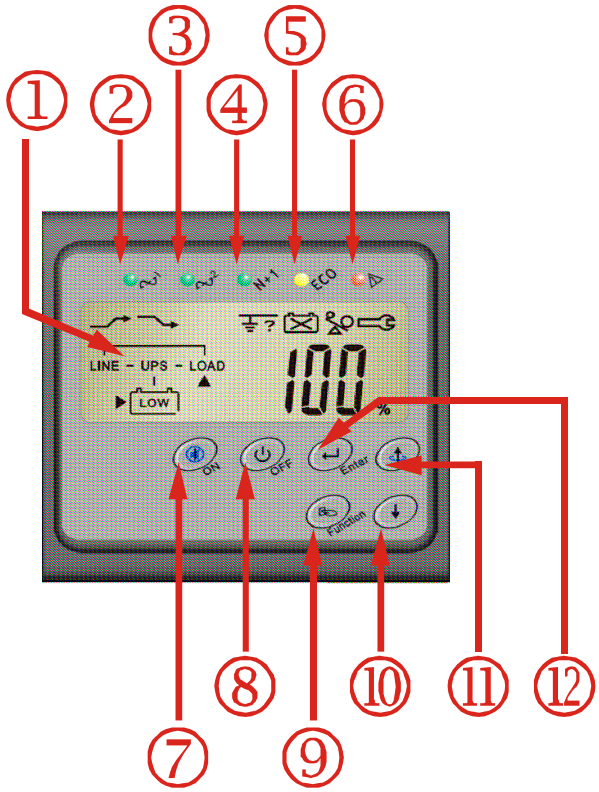
3. UPS Functional Descriptions

3.1. UPS Front Panel Display



① LCD Display

② Green LED steadily lights up to indicate that the utility input voltage is within the window; the LED flashes flickeringly to indicate that the utility input voltage is within the acceptable window.

③ Green LED lights up to indicate Bypass Input is normal.

④ Green LED lights up to indicate the UPS has the capability to run under redundancy mode.

⑤ UPS is working under ECO (Economic, Line-interactive) mode.

⑥ UPS Fault or Abnormal

⑦ UPS On/Alarm Silence

⑧ UPS OFF Switch

⑨ Special functions log in/out

⑩ Go to next page

⑪ Go to previous page or change the setting of the UPS.

⑫ To re-confirm the change of UPS Setting

3.1.1. Symbols on the LCD DisplayPanel

Item	Symbol	Description
1	LINE	Utility or Bypass Source
2	LOW	Battery Low
3		Battery Abnormal
4		UPS Overloading
5		UPS Working in Service Mode[1]
6		A Blackout Transfer occurred in UPS Output
7		Bypass Input Abnormal, UPS fails to transfer to bypass, Bypass Abnormal at ECO mode
8		Utility Input Abnormal
9	OFF	UPS Shutoff
10	LINE OFF	UPS Abnormal Lock
11	LINE – UPS – LOAD LOW	UPS Flow Chart
12	°C V Hz A %	4 Digit Measurement Display
13	▲ ▶	Indicates the item desired to be measured
14		UPS ON Switch or Alarm Silence
15		UPS OFF Switch

[1] *The specified modes include Normal mode, ECO mode, CVCF mode, etc..*

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16		Previous Page or Setting Change
17		Next Page
18		Special Function Log in /out
19		Enter or Reconfirmed
20		Utility Input Normal LED
21		Utility Input Normal LED
22		UPS under Redundancy Mode
23		UPS under ECO Mode
24		UPS Fault or Abnormal Warning LED
25	**EPO**	Emergency Power Off
26	**Er05**	Battery Weak or Dead
27	**Er06**	Output Short Circuit
28	**Er10**	Inverter Over-current
29	**Er11**	UPS Overheat
30	**Er12**	UPS Output Overloading
31	**Er15**	Wrong Procedure to Enter Maintenance Mode
32	**Er16**	Output Parameters Set Error in Parallel System
33	**Er17**	ID Numbers are in conflict in Parallel System or ID number Error in single unit
34	**Er21**	Parallel communication error (communication wire disconnected or failure to find ID1 UPS) in parallel system
35	**Er24**	CVCF mode with Bypass input
36	**Er27**	The UPS must be operated in normal mode in parallel system
37	**Er28**	Bypass Overload Time out and cut off output
38	**Er31**	The settings of both control board and driver board are not matched each other
39	**Er****	Other Error Code

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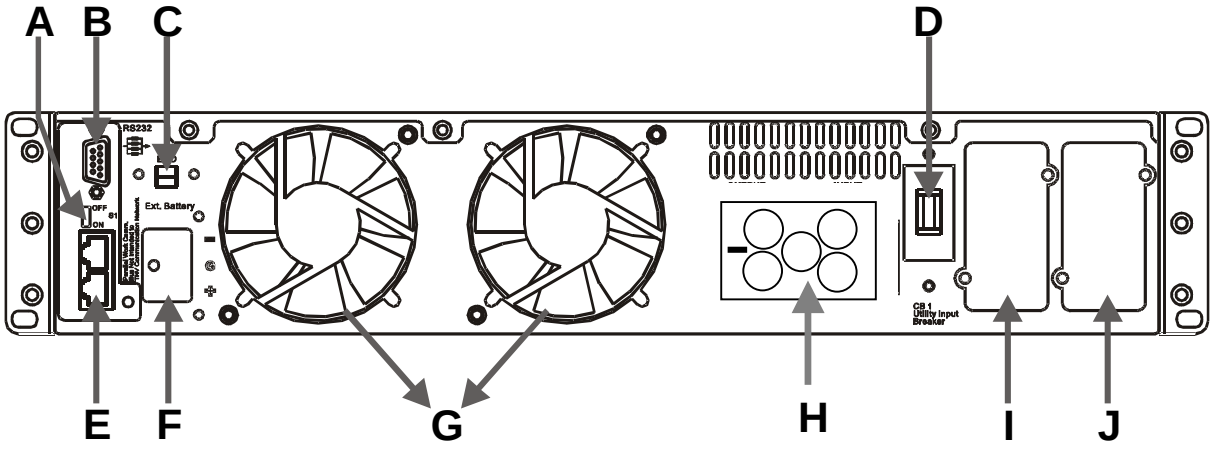
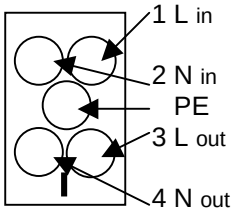
3.2. Rear Panel Descriptions



A Terminal Resistor for Parallel function
B RS232 Port
C EPO Port
D Utility Input Breaker
E CAN Bus Connection Port for Parallel System
F External Battery Connector
G Cooling Fan
H Utility Input &UPS Output Power Connector



I Customer Options Slot
J Slot

3.2.1. UPS input and output

Model	Maximum Current	Conductor Section
4,5 kVA	24 A	4 mm²
6 kVA	32 A	4 mm²

3.2.2. Battery input

Model	Maximum Current	Conductor Section
4,5 kVA	25 A	AWG #10, 6 mm²
6 kVA	25 A	AWG #10, 6 mm²

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3.3. Communication Port Explanation

The Communication port on the UPS provides true RS232 type communication with the UPS software to remotely monitor the power and UPS status.

With optional interface cards, including R2E(2nd RS232 plus EPO), RSE(RS485 plus EPO), USE(USB plus EPO), DCE(Dry Contact plus EPO), as well as SNMP/ card, you may combine them according to your demand. However, the R2E card, RSE card and USE card are prohibited to be used simultaneously.

The bundled UPS software is compatible with many operating systems such as Windows 98, & 2000, ME, NT and XP. For other applications like Novell, NetWare, Unix, Linux, please contact your local distributor for a proper solution.

When the optional interface cards are used with onboard RS232 port for communication, the shutdown command for the DCE card & also the EPO signals will get the highest priority in control command, then the SNMP/WEB card, then R2E, RSE and USE get the lowest priority.

Highest Priority (in descending order),

1) EPO input port
2) Optional Interface card
3) RS232

3.3.1. EPO (Emergency Power Off)

The Pin assignments of the EPO Input port are:

1	2

1 → EPO+
2 → Ground

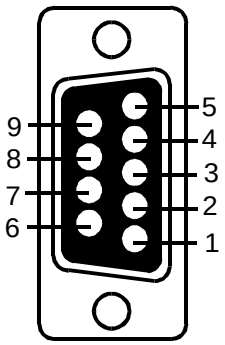
To enable the EPO function, please short Pin 1 & 2.

3.3.2. RS232 Port Descriptions

The RS232 interface shall be set as follows:

Baud Rate	**2400 bps**
Data Length	**8 bits**
Stop Bit	**1 bit**
Parity	**None**

The Pin Assignments of the true RS232 port are illustrated as follows:



Pin 3: RS232 Rx
Pin 2: RS232 Tx
Pin 5: Ground

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4. Installation

Warning!
Please thoroughly read the Safety Instructions (chapter 1.4) before installing the UPS

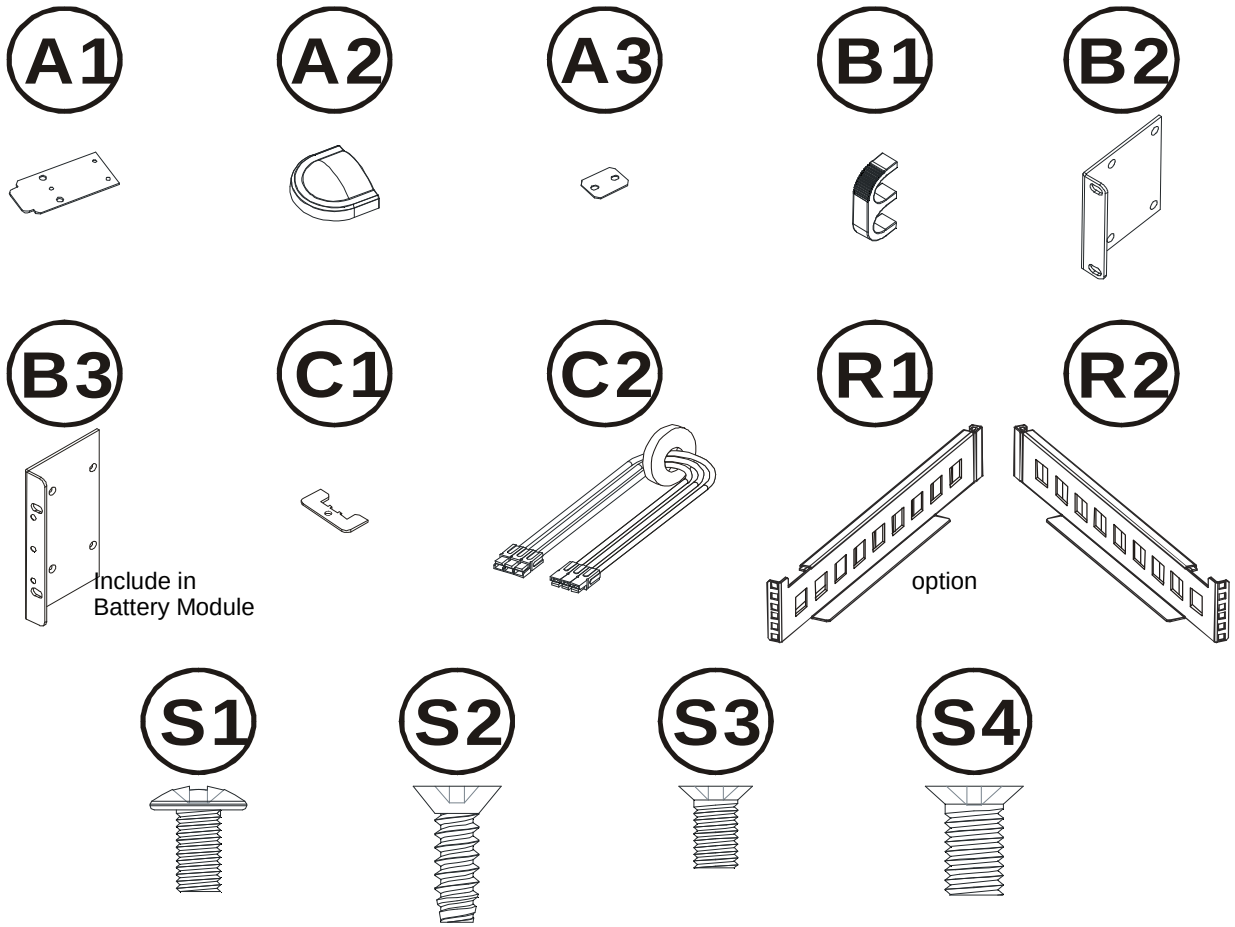
4.1. Unpacking

Inspect the delivery conditions of the UPS upon receipt and notify the freight forwarder and the dealer in case of any visible damage of the packing of the product

The packaging is recyclable; save it for reuse or dispose it properly.

- Remove the UPS from the carton box.
- Check the package contents. Standard contents shall include:

- 1 set of Users Manual
- 1 set of UPS communication software with RS232 cable
- 1 set of accessories pack



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4.2. Selecting Installation Position

Warning!
The UPS is heavy.

Select a location sturdy enough to handle the UPS weight. To ensure proper operation and long operating life, always position the UPS according to the following criteria:

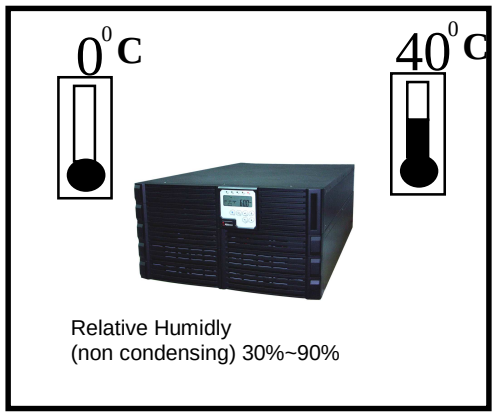
Keep minimum 30cm (12 inches) distance clearance from the rear panel of the UPS to avoid any obstructions.

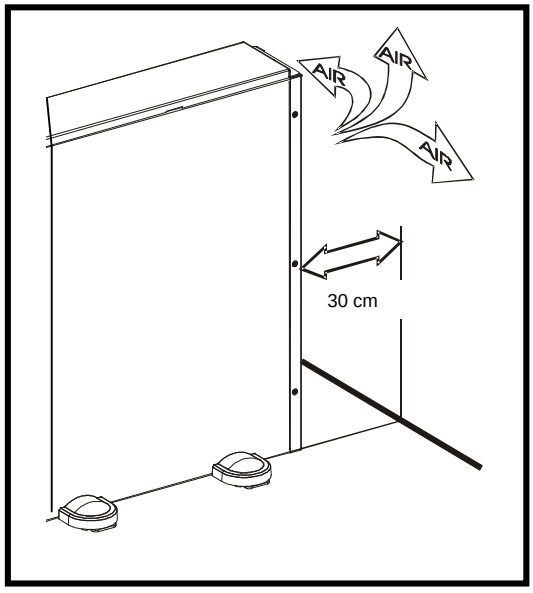
Do not block the air-flow to the ventilation louvers of the unit.

Please ensure the installation site is free from excessive dust and the ambient temperature and humidity should be within the specified limits.

Do not place the UPS in a dusty or corrosive environment or near any flammable objects.

This UPS is not designed for outdoor use.





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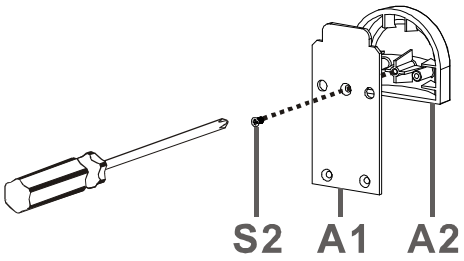
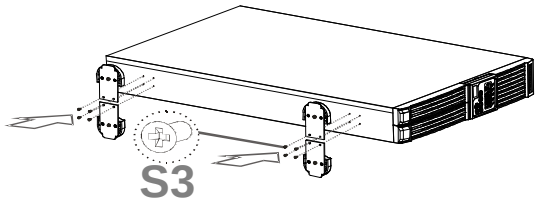
4.3. Assembling of the different System Components

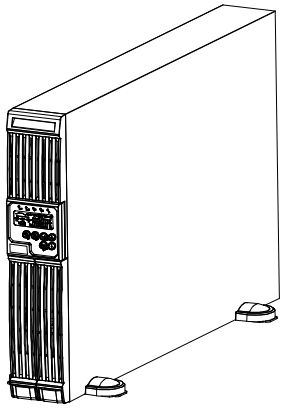
4.3.1. Tower Assembling steps

4.3.1.1. Power Module + Battery Module

Step1: Mounting of Foot Cover and Power Module







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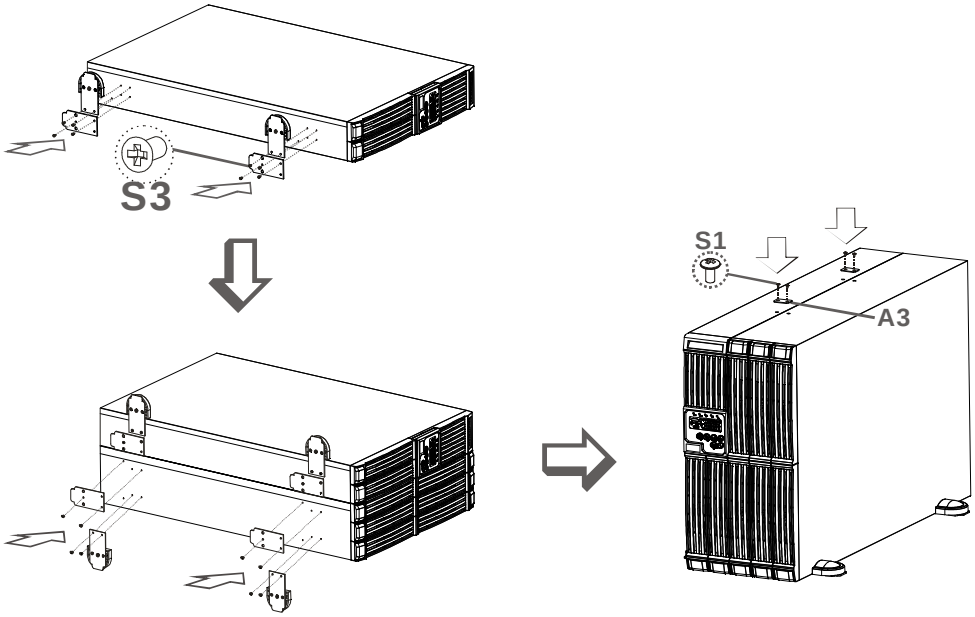
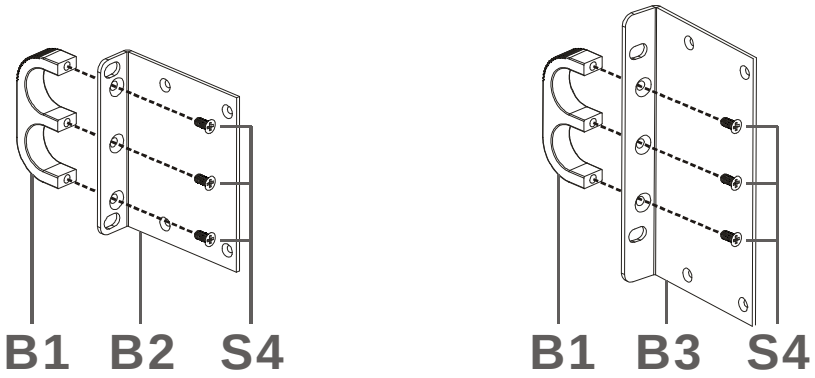
Step2: Installation of Power Module and Battery Module



4.3.2. Rack installation step

4.3.2.1. Power Module+ Battery Module

Step1: Mounting of Ear Handle



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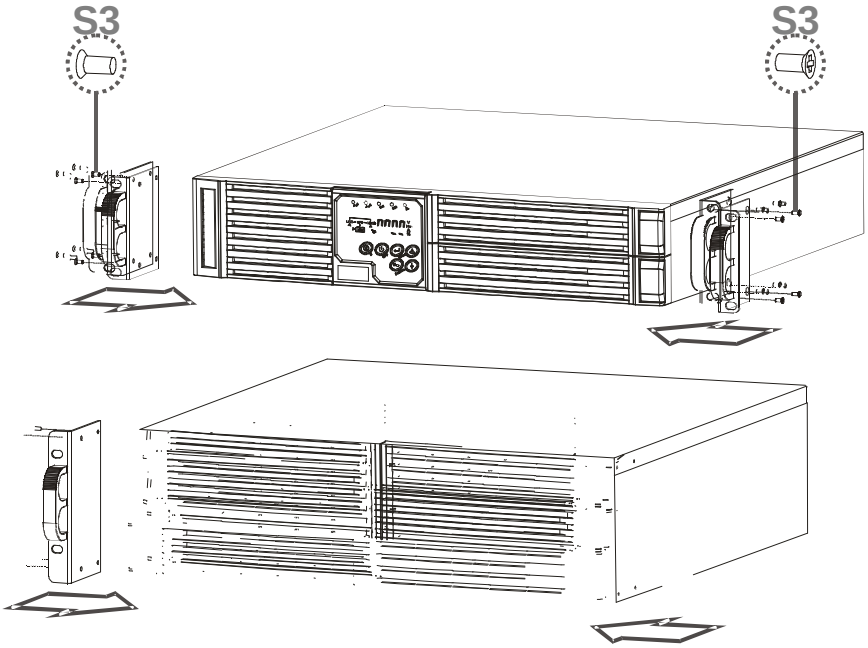
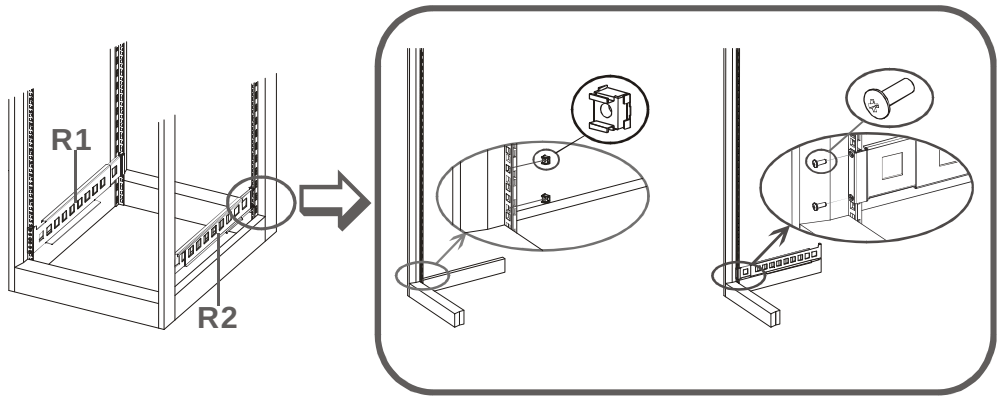
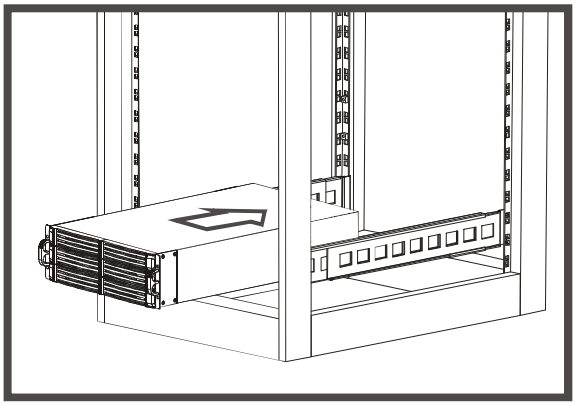
Step2: Installation of Ear Cover to Power and Battery Module

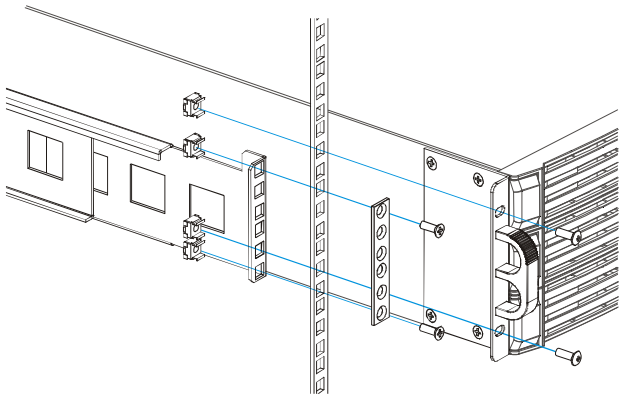


Step3: Installation of Rail to Rack



Step4: Installation Battery Module to Rail





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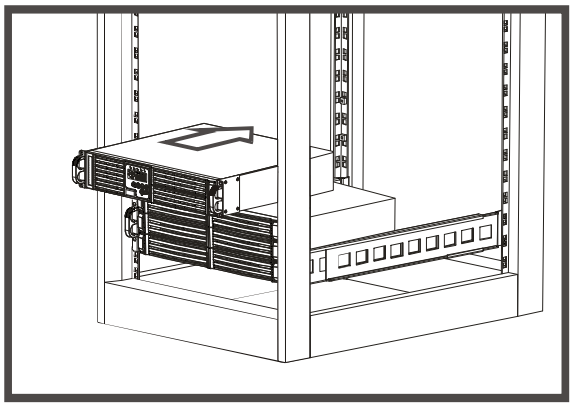
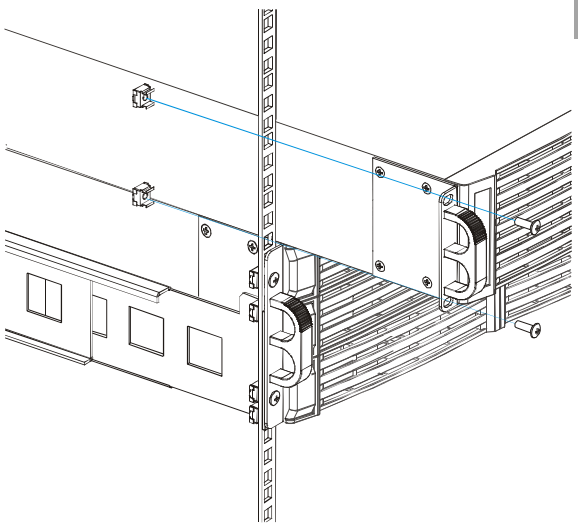
Step5: Installation Power Module





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4.4. Electrical Installation

Connect the UPS with the parallel hot swap chassis (DK7857.443 or DK7857.444), the external bypass (DK7857.441) or with installation cable DK7857.446. Please make sure, that the parallel hot swap chassis, the external bypass or the installation cable is installed correctly. For further information please read the manual of DK7857.443/DK7857.444, DK7857.441 or DK7857446.

Danger!

Before starting the installation, please make sure the grounding is connected properly.

- Make sure Utility breaker, UPS' Utility breaker is On "Off" position.

Warning!

Make sure the voltage of Utility matches with the input voltage window of the UPS.

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5. Operation

5.1. Start-Up In Normal Mode

- Connect the Utility to the parallel hot swap chassis or the installation cable. Switch on the Power Breaker of the distribution panel and the breakers of the UPS' Utility and Bypass Inputs, and then the UPS starts up. Green LEDs ⏦1 & ⏦2 light up to show the Utility and Bypass Inputs are normal and the LCD display with parallel function will illustrate Fig. A1, Fig. A2 to Fig. B. Otherwise the LCD display will illustrate from Fig. A2 to Fig. B.

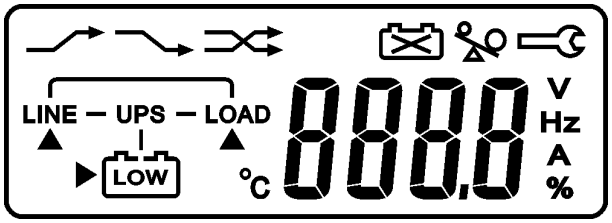

Fig. A1

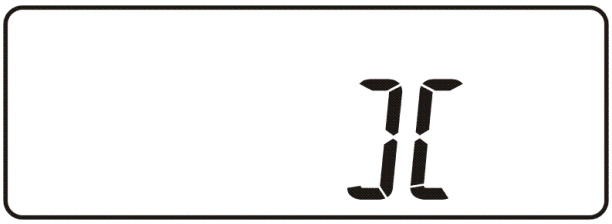

Fig. A2

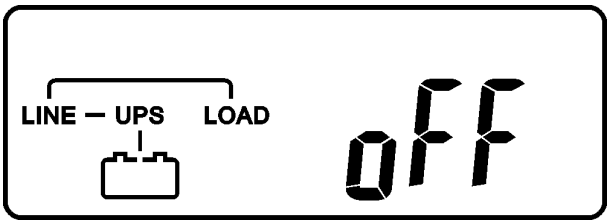

Fig. B

The UPS is on Bypass Mode now and it will proceed to self-test automatically. If there is no abnormal message it means the pre-startup of the UPS is successful and the charger starts to charge the batteries.

- Press the UPS On Switch ⏻ for approx. 3 seconds, then the Buzzer sounds twice and the LCD display changes from Fig. B to Fig. C.

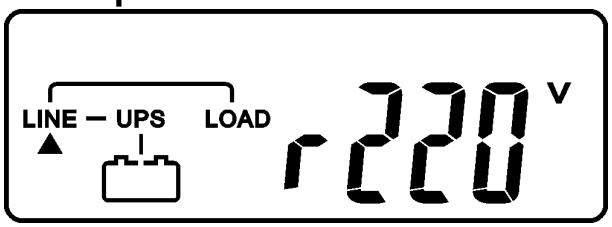

Fig. C

Then, the UPS is under self-test mode again, the LCD display will illustrate from Fig. C to Fig. D and remain approx. 4 seconds under battery mode, then illustrate from Fig. E1 to Fig. F if the self-test is successful.

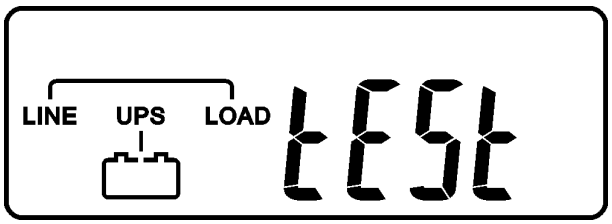

Fig. D: It shows "test"

EN

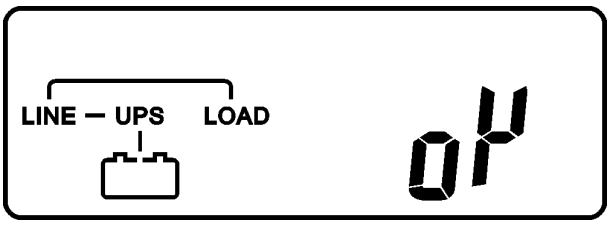

Fig. E1: It shows “OK” in self-test

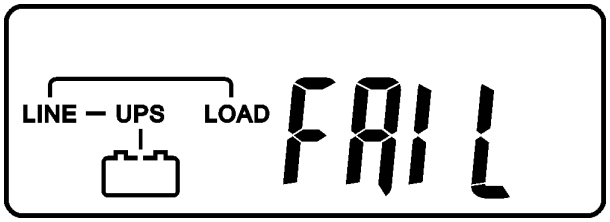

Fig. E2: It shows “Fail” in self-test

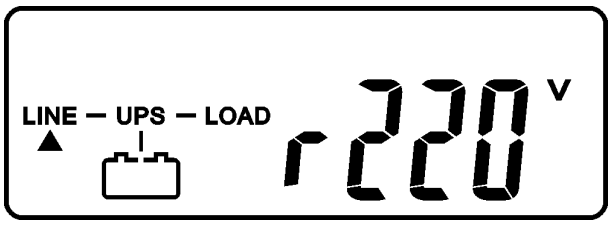

Fig. F: It shows “220Vac” in Utility Input

In case of failure in self-test, the LCD display will illustrate from Fig. D to Fig. E2, then an error code or error status will be shown on the screen.

Note!

Your start-up operation of the UPS is completed. Make sure the UPS is plugged onto the wall receptacle for charging at least 8 hours and the batteries of the UPS are fully charged.

5.2. Start-up in Battery Mode (Cold Start)

Note!

Make sure the UPS you have has already been installed with at least 1 set(20pcs) of 12V/7AH or 12V/5AH batteries.

- Push the UPS On Switch once for approx. 5 seconds to awake the UPS, and then the buzzer sounds twice. The LCD display will illustrate from Fig. A to Fig. G, and keep awake for approx. 15 seconds.
- Press the UPS On Switch of the UPS again for about 3 seconds till the LCD display illustrates from Fig. G to Fig. H, then the UPS will be in self-test Mode. The UPS may offer energy to the output in a minute, and the LCD display illustrates as Fig. I. In case of failure in pushing the UPS On Switch in 10 seconds, the UPS will automatically turn off. You then have to go through step in this chapter once again.

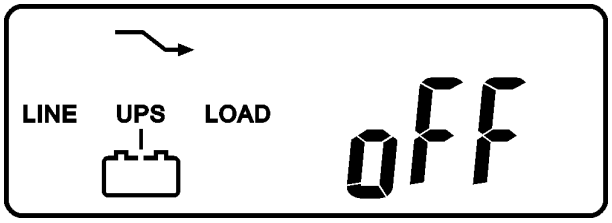

Fig. G: It shows “Off”, which means the UPS pre-start is successful

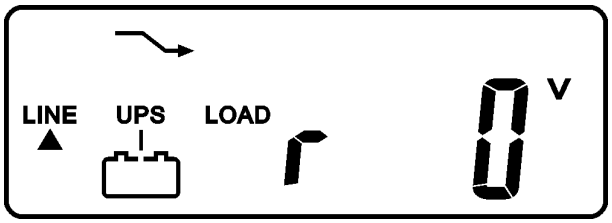

Fig. H: It shows Utility input is “0” and Utility Abnormal

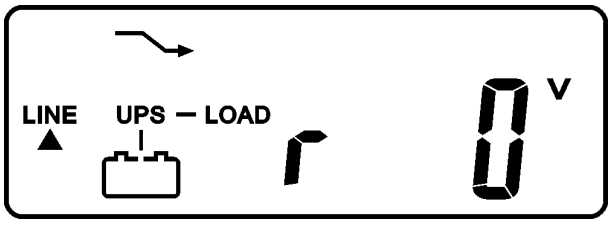

Fig. I

EN

5.3. Check Measured Values & Figures detected by UPS

If you would like to check the measured values & figures detected by the UPS, please use scroll down ⓘ and scroll up ⓘ key pads. When you use scroll down key pad, the LCD display will illustrate as Fig. C(Voltage from Utility Input) →Fig. I1(Voltage from Bypass Input) → Fig. J(Frequency from Utility Input) →Fig. K(Frequency from Bypass Input) →Fig. L(UPS Output Voltage) →Fig. M(UPS Output Frequency) →Fig. N(UPS Output Load %)→Fig. O(UPS Battery Voltage) →Fig. P(UPS Inner Temperature).

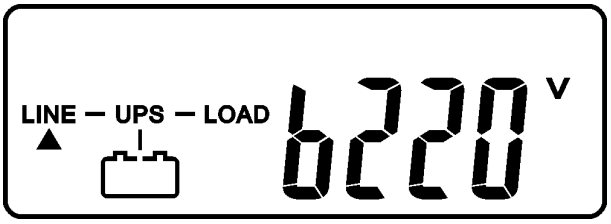

Fig. I1: It shows voltage comes from Bypass Input

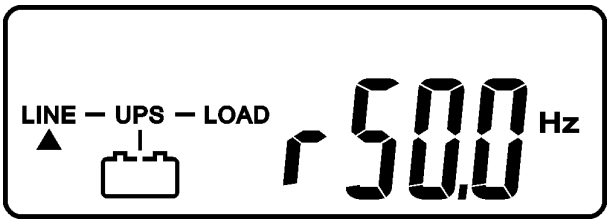

Fig. J: frequency from Utility Input

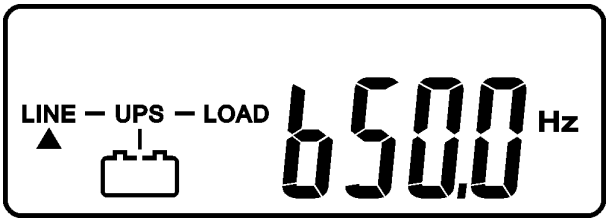

Fig. K: It shows frequency from Bypass Input

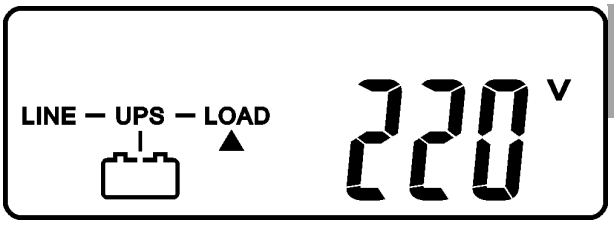

Fig. L: It shows UPS output Voltage

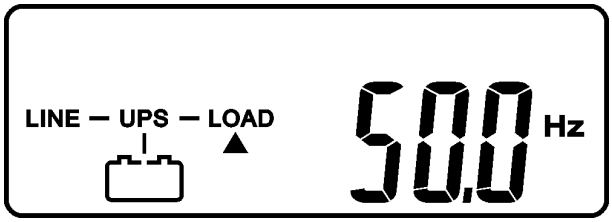

Fig. M: It shows UPS output frequency

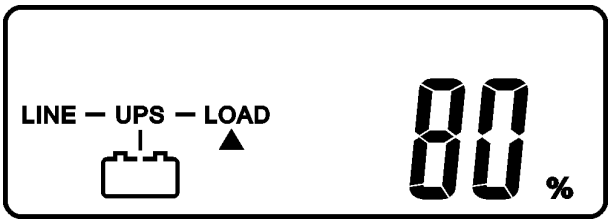

Fig. N: It shows UPS output load level(%)

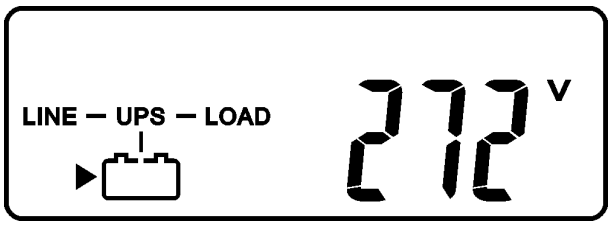

Fig. O: It shows Battery Voltage

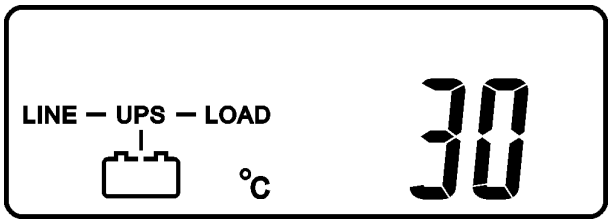

Fig. P: It shows UPS Inner Temperature

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5.4. UPS Default Data and Special Function Execution

- After the UPS completes start up, press ⏎ key pad to change the LCD display screen to Fig. Q1.

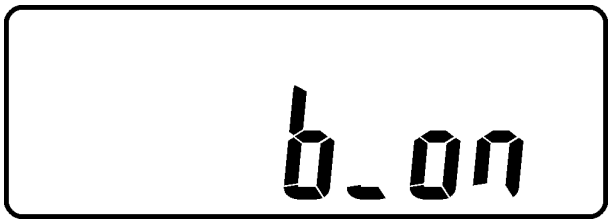


Fig. Q1: It shows buzzer “On”

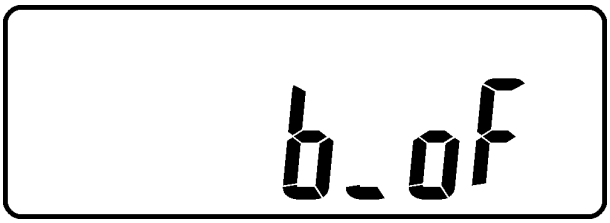


Fig. Q: It shows buzzer “Off”

- Press ↓ key pad to scroll down the screen and check the UPS settings. The LCD display will subsequently show: Fig. Q1 (buzzer) → Fig. R1 (Self-test) →Fig. S1 (Bypass Voltage Windows) → Fig. T (Output Frequency Synchronization Window) →Fig. U (Inverter Output Voltage) →Fig. V1 (UPS Operation Mode) →Fig. W (Output Voltage Micro Tune Value) →Fig. X (UPS Id) →Fig. Y (No. of UPS in Parallel).

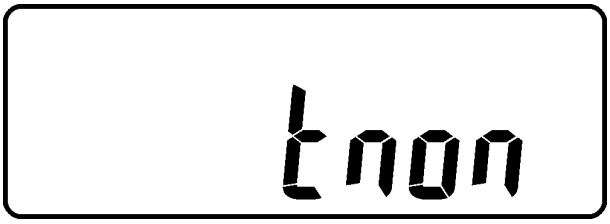


Fig. R1: It shows self-test is NOT “on”

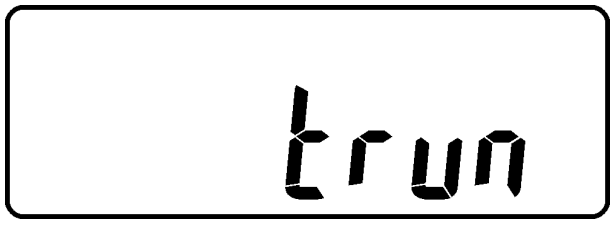


Fig. R2: It shows self-test is “On”

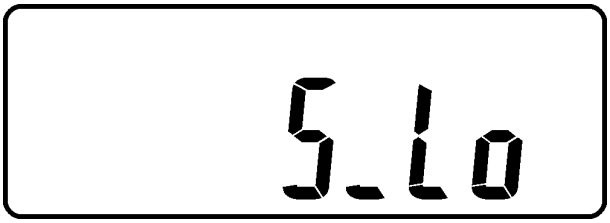


Fig. S1: It shows Bypass Voltage is adjusted to narrow tolerance

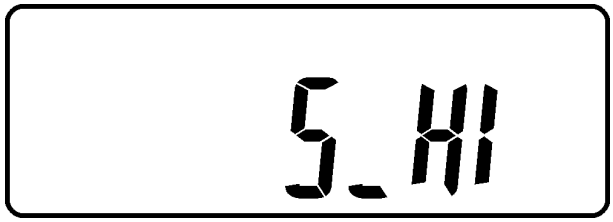


Fig. S2: It shows bypass voltage is adjusted to wider tolerance

Fig. T: It shows Frequency Window is +/-3Hz

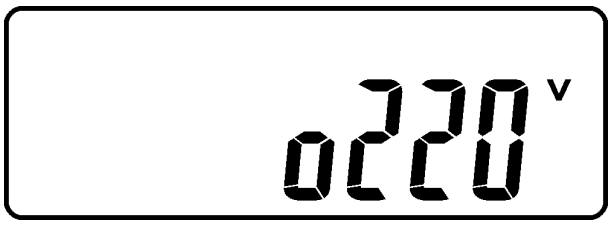


Fig. U: It shows inverter output voltage

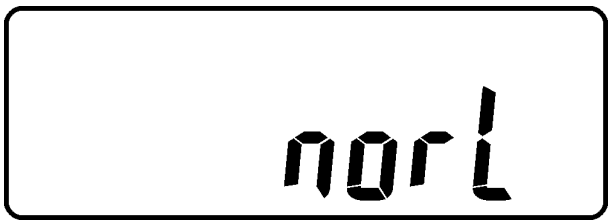


Fig. V1: It shows the UPS is operated in "normal mode"

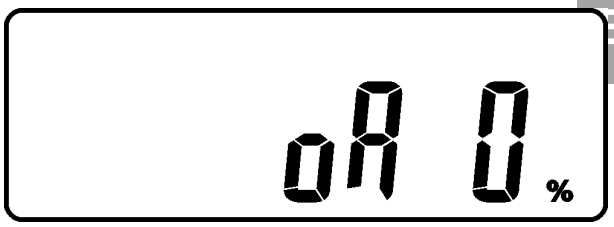


Fig. W: It shows Output Voltage Adjustment % from 0% to 3% or -0% to -3%

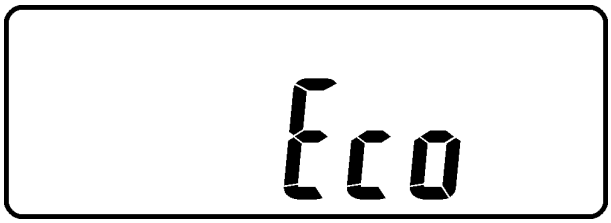


Fig. V2: It shows the UPS is operated in "Eco mode"

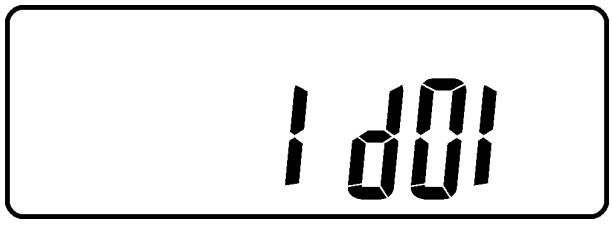


Fig. X: It shows UPS Identification Number

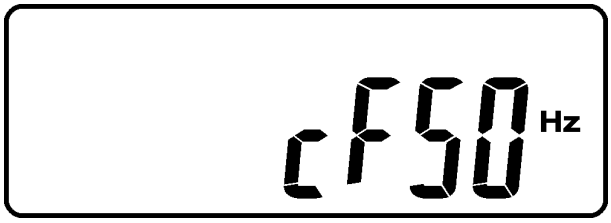


Fig. V3: It shows the UPS is operated in "CVCF 50Hz mode"

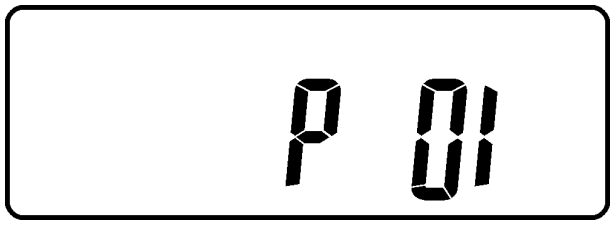


Fig. Y: It shows the UPS is the 1st of the parallel systems

- Press scroll up key pad to execute special functions. The functions includes buzzer ON (as Fig. Q1), or buzzer OFF (as Fig. Q2, Alarm silence for UPS Warning) and self-test OFF (As Fig. R1) or self-test ON. (as Fig. R2. UPS will execute battery test for 10 seconds. If the self-test is successful, it will show as Fig. E1; otherwise, it will show as Fig. E2 & error message at the same time.)

Note!

If you want to set a frequency converter, it must be done by a qualified technician.

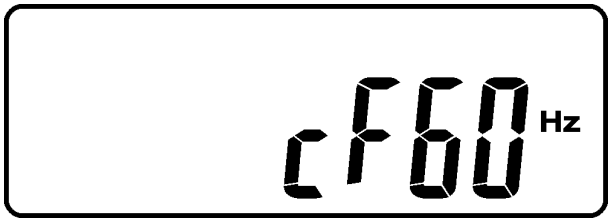


Fig. V4: It shows the UPS is operated in "CVCF 60Hz mode"

Note!

If you want to set a frequency converter, it must be done by a qualified technician.

EN

5.5. UPS Default Settings and their alternatives

- Make sure the UPS is not “On” yet. Press On Switch and scroll down key pads simultaneously for approx. 3 seconds, the buzzer will sound twice, the LCD display screen shows as Fig. Q1, then the UPS is under setting mode.

To scroll down the LCD screen, you may refer to Chapter 5.4.

Except for Buzzer (as Fig. Q1 & Q2) and Self-test (as Fig. R1 & R2), all the remaning default settings may be changed by pressing scroll up key pad.

Fig. S1 and S2 show the bypass input acceptable window, it can be 184 VAC ~ 260 VAC or 195 VAC ~ 260 VAC.

Fig. T shows the bypass frequency window of the Inverter Output, the acceptable setting values are ±3 Hz and ±1 Hz.
Fig. U shows the acceptable Inverter Output Voltage, of which voltage is 200Vac, 208Vac, 220Vac, 230Vac, or 240Vac.

Fig. V1, V2, V3 and V4 show the operation modes of the UPS, of which the alternatives are Online, Eco(Economic) mode, fixed 50 Hz Output or fixed 60 Hz Output.

Fig. W shows the adjustments of the Inverter Output, which may be calibrated as 0%, +1%, -1%, +2%, -2%, +3%, or -3%.

Fig. X shows a specified address & position of the UPS when the UPS is in Parallel mode. The settable numbers are from 1st to 4th.

Fig. Y shows the total number of UPS in parallel. The settable numbers are from 1 to 4.

When all the setting changes are done, you have to press enter key Pad to save all the changes when the LCD screen shows as Fig. Z, then, the LCD screen will show as Fig. AA to complete the setting changes. If you don’t want to change those settings, you may press “OFF” key pads for 5 seconds, then the LCD screen turns to Fig. AA directly, which means your setting changes are invalid.

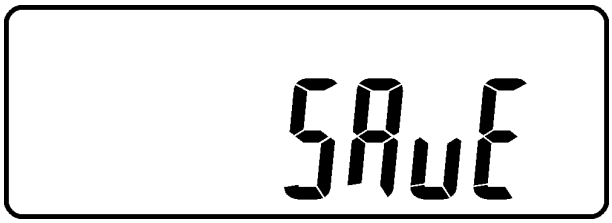


Fig. Z: Please press Enter key to save data.

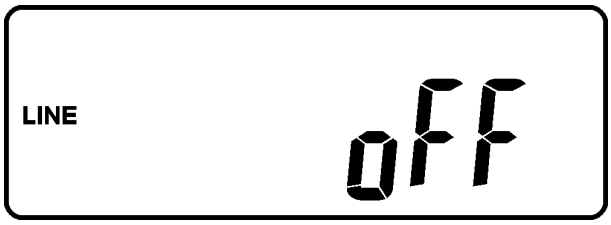


Fig. AA: It shows the UPS is locked

- Turn Off the breaker of Utility Input.

Your Setting changes are complete.

5.6. UPS Is Off Due to Unknown Reason and It’s Trouble Shooting

If there is a serious abnormal condition the UPS will lock it itself in “OFF” position as shown in Fig. AA and an abnormal message will show on the LCD screen

After 3 seconds, all messages will be locked except Bypass messages(LED ∿2 & LCD ↗). In cases where the Utility is abnormal after the UPS is locked, the LED ∿2 will be extinguished and the LCD will be shown on the LCD screen.

To release the UPS lock, please complete the following:

- Check those error messages recorded.
- Check Chapter 3.1.1 to trouble shoot the problem of the UPS.

Otherwise, consult your local distributor for service.

- Press Off key pad for 5 seconds and buzzer will sound twice.
- Turn Off the Breaker of Utility Input.
- The UPS lock problem is solved now, but you should consult with your Local distributor to make sure the error message shown is solved.

5.7. Shut Off

- Press Off key pad for about 5 seconds, the Inverter output will be turned off, then the output load is supplied by Bypass loop and the LCD screen shows as Fig. B.
- Turn Off the breaker of Utility Input.

The UPS is turned off completely.

5.8. Maintenance Bypass Mode

Note!

A Non-authorised technician is not allowed to operate the following procedures. If there is any damage under unauthorised condition, your warranty will be void immediately.

- Press the Off key pad for approx. 5 seconds, the LCD screen shows as Fig. B and the UPS output is in bypass mode.

Release the cover of the CAM Switch(Maintenance Bypass Switch) first, then turn on the CAM Switch to “Bypass” mode, and at the right-hand upper Corner of the LCD screen will show sign.

- Turn off the UPS Utility breaker as well as the Bypass Input Breaker, you can now carry out UPS maintenance .

To repeat 1.1, you may put the UPS back to normal working mode, then turn back the CAM switch to “INV” mode, fasten back the cover and repeat 1.1 The UPS will switch back to inverter mode.

It is required to go through 5.8 first, then go through 5.8 If you skip 5.8, the UPS will alert for 10 seconds to warn that the procedure is abnormal, which may damage the UPS due to uncertain utility status. The UPS will switch back to Inverter mode immediately if you turn the CAM switch back to “INV”.

EN

6. Troubleshooting Guide

6.1. Troubleshooting

When the UPS malfunctions during operation, you may check the following:

a. Is the input and output wiring correct?

b. Is the input voltage of the Utility within the input window of the UPS?

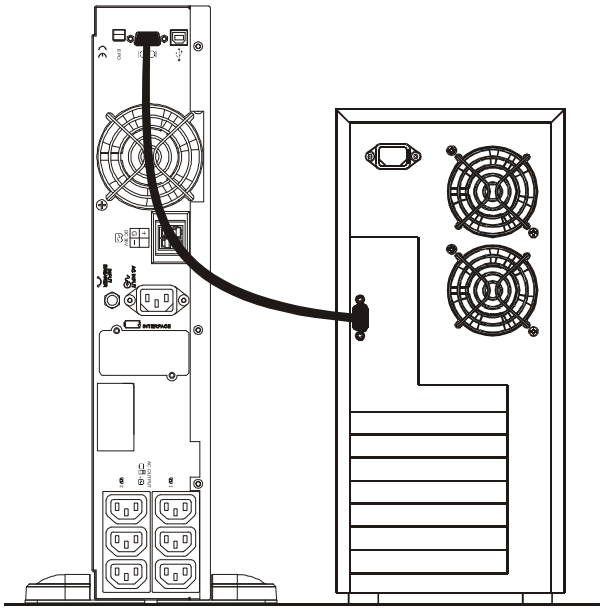
In case of problems or if symptoms still exist, please carry out the following steps. If the problem persists, please contact your local distributor for help.

Situation	Check Items	Solution
UPS Red Fault LED lights up:	Check the error code shown on the LCD screen 1.Er05, & 2.Er06, Er10, Er12, Er28 & 3.EPO 4.Er11 5.Er15 6.Er16, Er27 7. Er21 8.Er24 9.other error code	1.Check to see if the battery connection is properly done, then re-charge the batteries for 8 hours to see whether the UPS may backup normally; otherwise, consult your local distributor right away. 2. Remove some uncritical load at the UPS output end. If any damage of the coating of AC power cord, please replace a new one. 3. Remove the short circuit occurred at the EPO terminal. 4. Remove the objects blocked on the ventilation holes. 5. Make sure the UPS is operated normally. If it is on CVCF mode, you have to turn off and turn on the UPS again. 6. All of the parameters except ID Number in the parallel UPS must be same. Please refer chapter 5.5 to set them again 7. Reconnect the RJ-45 wire or set a UPS with ID=1. 8. When the UPS is on CVCF mode, it is prohibited to have bypass input. You have to turn off the UPS and bypass input and re-start the UPS. 9. Consult your local distributor for help.
UPS fails to offer battery backup or its back up time is shorter than its calculation.		If the backup time is still too short after 8 hours of charge, please contact your local distributor for battery replacement.
UPS locks itself and it can not be turned off.		Please refer to chapter 5.6 to trouble shoot the problem; otherwise, consult your local distributor for help.

7. Bundled Software Installation Guide

7.1. Hardware Installation

1. Connect the male connector of RS232 cable to the UPS communication port.
2. Connect the female connector of the RS232 cable to a dedicated RS232 port of the Computer.
3. For optional interface cards, please refer to Chapter 8 for more details.

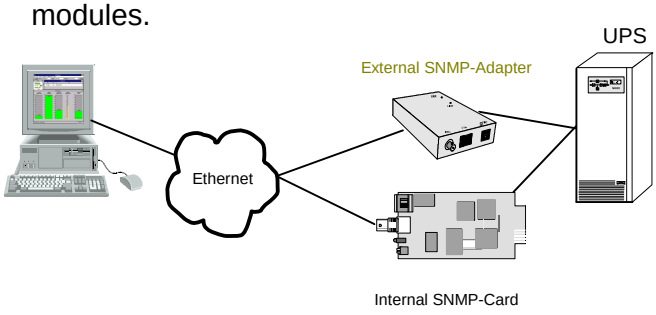


7.2. Software Installation

Please install the Software which is on the enclosed CD or visit our website www.rimatrix5.com and for download from UPS software http://www.rimatrix5.com/service_support/downloads.asp

8. Optional Communication Card

The **S**imple **N**etwork **M**anagement **P**rotocol (SNMP) is a worldwide-standardized communication-protocol. It is used to monitor any device in the network via simple control language. The UPS-Management Software also provides its data in this SNMP format with its internal software agent. The operating system you are using must support the SNMP protocol. We offer our software with SNMP functionality for Novell, OS/2, all Windows running on INTEL and ALPHA, DEC VMS, Apple.
Two types of SNMP interfaces with identical functionality are available: an external SNMP-Adapter (Box) and an internal SNMP-Card. Both can manage a parallel system (N modules) and return either global values - which are consistent for the whole parallel system - or specific values from the single modules.



8.1. SNMP Adapter

The adapter may be configured via Telnet, HTTP (Web-Browser) or serial connection (Terminal). For normal operation at least one network connection (Ethernet) is required.

The SNMP adapter can be used, utilising the RCCMD send function, for an automatic network wide shut down or just for informing connected users. The shut down procedure can be initiated on a low residual battery autonomy time (downtime) or by a countdown timer which is started at the beginning of the alarm. A shut down is therefore possible without extra input from the operator, and is fully software controlled.

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8.2. Internal SNMP Adapter

The Internal SNMP-Card can be inserted into the appropriate slot of the **PMC12.** This adapter communicates via the serial port of the UPS and makes a direct multiple server shut down possible without additional SNMP management software.

For detailed information please see Software Manual provided with the PMC-Software CD ROM.**RCCMD - Remote Console Command module** for a multi-server shutdown. This stand-alone software module is designed to receive and execute a command issued by a remote device. Thanks to RCCMD it is possible to execute a shutdown in an heterogeneous multiplatform network. The new release RCCMD2 is an application available for all Operating Systems, analogous to PMC-Software. Our SNMP Interfaces are compatible to RCCMD.

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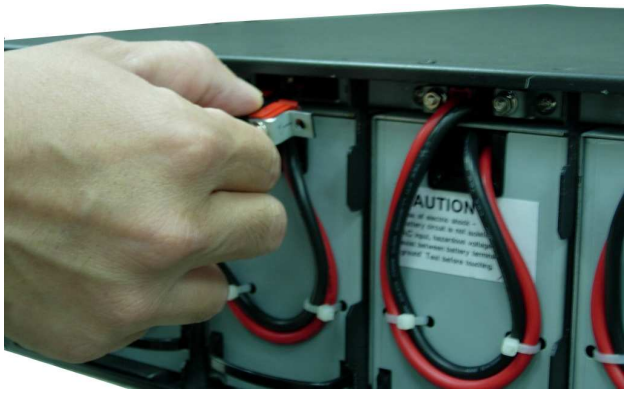
9. Hot Swappable Battery Replacement

1. Unscrew the flange of the battery bank front panel as indicated in Step 1.

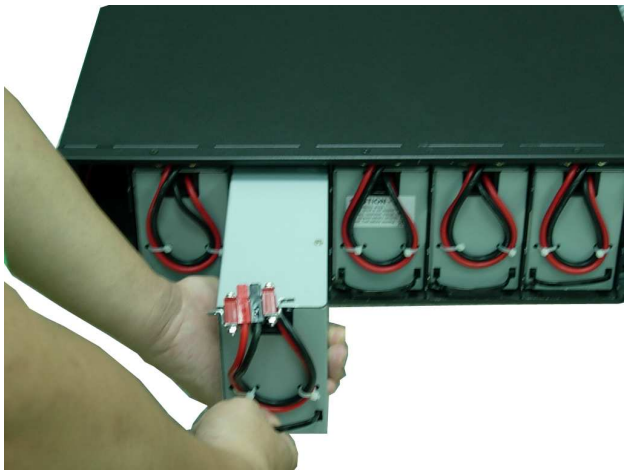
2. Remove the front panel as indicated in Step 2.

3. Remove the screw of the battery pack as shown in Step 3.

4. Unplug the hot swappable battery connectors as shown in Step 4.



5. Remove the battery packs from the battery bank as shown in Step 5.



10. Customer Service

If you have any technical questions or questions concerning our product spectrum, contact the following service address:

Tel.: +49 (0)2772/505-1855
http://www.rimatrix5.com
E-mail: info@rittal.de

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11. Technical Data

Model	4,5 kVA		6 kVA	
INPUT				
Voltage Window	160~280 VAC*			
Frequency	45 ~ 65 Hz			
Phase/Wire	Single, Line + Neutral + Ground			
Power Factor	Up to 0.99 at 100% Linear Load			
Current THD	<6% at 100% Linear Load			
OUTPUT				
Voltage Window	220/230/240 VAC Selectable			
Voltage Adjustment	0%; ±1%; ±2%; ±3%			
Voltage Regulation	±2%			
Capacity	4500 VA/3150 W		6000 VA/4200 W	
Rated Power Factor	0.7 Lagging			
Wave Form	Sine Wave, THD<3%(no load to full Linear load)			
Frequency Stability	±0.2%(Free Running)			
Frequency Regulation	±1%; ±3%			
Transfer Time	0ms			
Efficiency(AC to AC, Normal)	Up to 90%			
Efficiency(AC to AC, ECO)	Up to 97%			
Autonomy at load	50%	100%	50%	100%
1 Battery	20 Min.	9 Min.	18 Min.	8 Min.
2 Batteries	48 Min.	23 Min.	45 Min.	20 Min.
3 Batteries	95 Min.	39 Min.	74 Min.	33 Min.
DC Start	Yes			
BATTERY				
Type	Sealed Lead Acid Maintenance Free 12 V / 7 AH			
Quantity	20 pcs			
Voltage	240 VDC			
Recharge Time	4 hours to 90%			
DISPLAY				
Status On LED + LCD	Line Mode, Backup Mode, ECO Mode, Bypass Supply, Battery Low, Battery Bad/Disconnect, Overload, Transferring with interruption & UPS Fault.			
Readings on LCD	Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage & Inner Temperature.			
Self-Diagnostics	Upon Power-on, Front Panel Setting & Software Control, 24-hour routine checking			
ALARMS				
Audible and Visual	Line Failure, Battery Low, Transfer to Bypass, System Fault Conditions			
PHYSICAL				
Dimensions(WxDxH)mm	440x88x660(UPS Module)			
Input/Output Connection	Hardwire			
External Battery Connection	Plug-in & Play			
Net Weight(Kgs)	24(UPS Module)			

Battery Bank Dimensions	Convertible(Rack/Tower)
BBC20J0007(20pcs 12V/7AH)	440x133x660(3U)
Battery Bank Net Weight	Convertible(Rack/Tower)
BBC20J0007 w/o bat./with bat.	18 kg/ 68 kgs
ENVIRONMENT	
Operating Temperature	0°C to 40°C
Temperature Warning	The battery design life is based on a temperature of 25° C. Ambient temperature above this range will reduce battery life.
Altitude	0~2000 m up to 40°C, 3000 m up to 35°C
Humidity	90% RH Maximum, Non-Condensing
Noise	<50 dB (at 1 meter)
COMPUTER INTERFACE	
Interface Type	Standard RS232 Interface, USB & EPO
Communication Slots	SNMP/WEB Card
SAFETY CONFORMANCE	
Quality Assurance	ISO9001 Certified Company
Safety Standard	EN62040-1, UL1778
EMC Standard	EN62040-2, EN61000-3-2, EN61000-3-3, FCC Class A
Marks	CE, WEEE

* (160~176Vac at <75% load)